AMSAT SATELLITE REPORT

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UO-9 — SRI Status

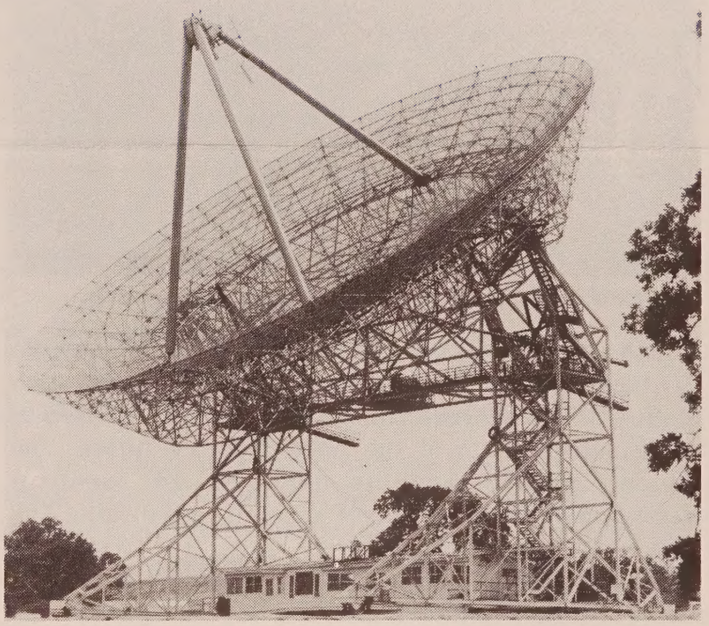
Efforts to salvage the UoSAT-OSCAR 9 mission continue in earnest in California. Recently (See *ASR* #38, 39) the effort at SRI International involved 70 cm command transmissions from the 46 meter (150 foot) Stanford dish. (See photo in this issue.) When these efforts proved fruitless the decision was taken to move to 2 meters where, it is calculated, a higher probability of success will be enjoyed.

To transmit at 2 meters, a number of changes had to be made. According to Dr. Bob Leonard, KD6DG, SRI International Radio Physics Lab Director and ad hoc Project Leader for the UO-9 effort, a new, circularly polarized feed for 2 meters is being fitted to the dish. A new 2 meter amplifier has been installed. A minor setback occurred when one of the huge azimuth drive motors failed with an open winding. Worse yet, the off-line spare proved inoperative as well. The repairs were effected on one of the defective motors the week of 16 Aug. and, at press time, 2 meter operations were to commence on or about 23 Aug. at favorable orbital times.

The SRI 2-meter effort will yield perhaps 10 to 12 dB higher ERP levels than were attainable at K1WHS with the latter's EME array in Lebanon, Maine. After nearly a year in orbit UoSAT has expended perhaps a third or a half of its predicted life. Should the present salvage attempts at SRI fail, it is difficult to imagine what other heroic measures might remain to be undertaken. In typical gallows humor fashion, an unnamed, would-be UO-9 user commented that perhaps part of the investment might be recouped by offering UO-9 to the superpowers as an ASAT (anti-satellite weapon) target drone! Apparently the frustration of the AMSAT UK program office is shared by the potential user community.

Proposal: Two Geo-Sync OSCARs *for "Late '85"*

A comprehensive proposal for a system of geosynchronous satellites has been filed with the Federal Communications Commission (FCC) by a Florida cable TV operator. The petition to the FCC contains a proposal to place two amateur radio satellite transponders, often referred to generically as "OSCARs," in a geosynchronous orbit over the Western Hemisphere in conjunction with the primary payloads of two geosynchronous domestic satellites (domsats).



The SRI 150-foot dish

Cablesat General Corporation of Cocoa, Florida, in its 5 August 82 petition to the FCC has requested permission to build, launch and operate two C-band domsats and one ground spare. According to the filing, the domsats would be placed at both ends of the geosynchronous arc serving the Western Hemisphere. The Cablesat East bird would be located over the equator between 60 and 70 degrees west longitude and Cablesat West would be placed over the equator between 140 and 150 degrees west. From these vantages the two birds could serve the entire continental United States, most of Canada and Mexico. The downlink footprint would also cover much of the Carribean.

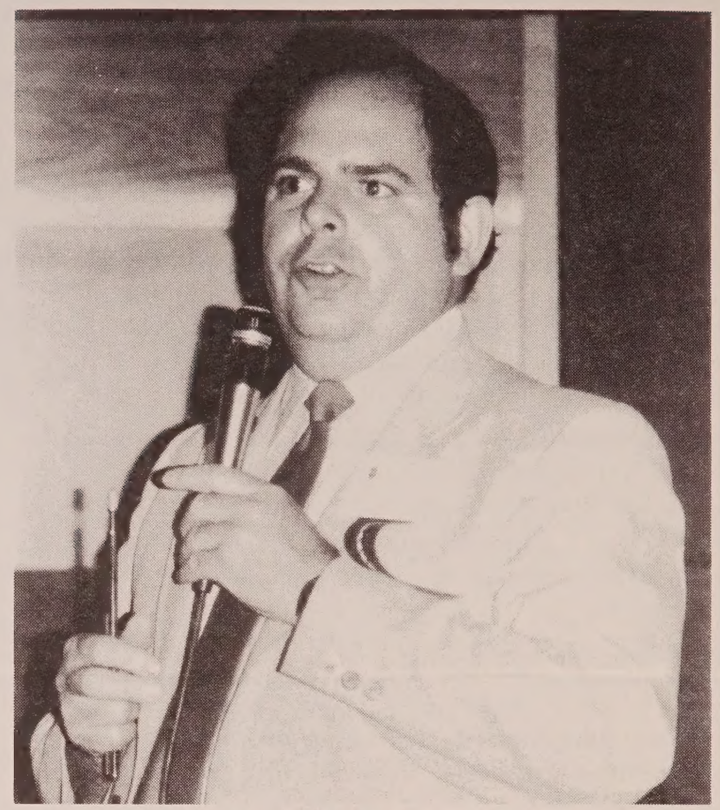
The proposal calls for a "late 1985 or early 1986 launch" aboard STS/PAM-D. That is the Space Transportation System (Shuttle) with a Payload Assist Module, Type D.

The President of Cablesat General is Mr. Raymond A. Kassis of Cocoa, Florida. Ray is also known as WA4OHK. It is through his efforts that both Cablesat satellites may also include C-band amateur transponders.

The commercial domsats were proposed by RCA Astro Division, Heightstown, New Jersey. It is thought that several of the hams at Astro helped put together the amateur transponder proposal which accompanies the main proposal. The entire document runs over 500 pages.

(Continued on next page)

W3IWI addresses the AMSAT forum at Cedar Rapids.



KØRZ addresses the AMSAT forum at Cedar Rapids.

RCA communications satellites (for example, Satcom IV) have served TV viewers for years bringing such features as Home Box Office (HBO) to tens of millions of cable subscribers and the occasional TV pirate. The typical modern satellite contains 24 identical transponders each capable of a 36 MHz bandwidth. The standard frequencies are in the range of 6 GHz (6000 MHz) uplink and 4 GHz (4000 MHz) downlink. Some present and future birds use 14 GHz and 12 GHz for the uplink and downlink, respectively.

Cablesat proposes that each domsat have on board an OSCAR with an uplink in the 5.65 to 5.67 GHz range and a downlink in the 3.40 to 3.41 GHz range. The bandwidth is proposed to be 10 MHz. The satellites would be interconnected at the command station to be built in the midwest so that a virtual inter-satellite link would exist. The system would be called ARNET for Amateur Radio Network Experimental Transponder. ARNET would also be the name of a not-for-profit corporation that would be established as owners of the satellites. According to the proposal, Cablesat would donate the OSCARs to ARNET. ARNET would in turn assign operational responsibility to ARRL. ARRL would also be responsible for usage planning, coordination, activation and publicity for the project.

Typical amateur ground station requirements envisioned in the proposal include a 2 meter (6 foot) dish with less than 10 watts for the uplink and a figure of merit of about 10 dB/K on the downlink. The 5.6 and 3.4 GHz bands were allocated for amateur space use by WARC-79.

Cablesat General Corporation has retained the Washington, D.C. firm of Shrinsky, Weitzman and Eisen to represent them in this matter. Mr. Eisen, contacted at his office by AMSAT VP K1HTV, said he was aware of AMSAT and his client earnestly hoped for AMSAT's support in his petition to the FCC.

Meanwhile, AMSAT officials who saw the technical proposal were, in general, favorably disposed towards it. Engineering Vice President Jan King, W3GEY, said that overall it appeared to be a good project in terms of the benefit to amateur radio in that, if successful, it would stimulate growth in amateur use of microwaves. Jan did have a number of reservations and open questions as regards some of the specifications proposed. "A detailed analysis must, by necessity, precede any declarations on the merits of the whole concept," stated Mr. King after a quick walk-through of the specifications. AMSAT President Tom Clark, W3IWI, underscored Jan's comments and felt that further study of the matter was definitely in order. AMSAT Chairman John Browning, W6SP, contacted on the road by *ASR* withheld comment until he had a chance to see the proposal but volunteered that it seemed like a good idea. John is also Chairman of Project OSCAR which, together with AMSAT Canada, seeks to find a ride for its SYNCART transponder; a ride to a geosynchronous slot! Project OSCAR President Dr. John Pronko, W6XN, was on vacation and could not be reached by *ASR*. AMSAT Canada President Dr. John Henry, VE2VQ was away on business and likewise could not be contacted for his reaction to the Cablesat ARNET proposal.

ARRL General Manager Dave Sumner, K1ZZ, was interviewed by *ASR* on the Cablesat proposal. The following is a distillation of the 30 minute telephone interview.

ASR: How did the Cablesat proposal come to ARRL attention?

ARRL: Cablesat approached ARRL a couple of months ago about placing a system of geosynchronous satellites in orbit. ARRL responded, in effect, that if it could be done at not cost to ARRL, that it could support the concept.

ASR: Has ARRL analyzed the proposed amateur transponder capabilities?

ARRL: If you mean a detailed analysis, that has not yet been performed. However, we have a general sense of what can be accomplished in 10 MHz with the system parameters proposed and an appreciation for several important limitations. The big problem will be power generation at 5 GHz. For the amateur community that is a very big challenge. It's neither easy nor inexpensive. And, though the price of suitable components is falling rapidly, it will still be a major challenge 5 years hence.

ASR: What about the new GaAsFET LNAs that yield 110 degree Kelvin and less for receive and the new power GaAsFETs that are becoming available? Will they help?

ARRL: Sure. But uplink transmit power will likely remain the limiting factor.

ASR: What types of transmissions do you see on ARNET?

ARRL: I think FM will have a place and that a great deal of experimentation will be possible.

ASR: Are the proposed frequencies part of WARC-79 and if so, when do you think the treaty will be ratified?

ARRL: Yes. These frequencies were allocated at WARC-79. I believe it's possible that the treaty will be ratified by year's end.

ASR: What are your feelings for the likelihood of the petition to the FCC meeting with success?

ARRL: Well I'm not really an expert in these things. I want to make that clear. However, it is my impression that the geosynchronous slots applied for are not among the most desireable there are. That should help a bit. I don't know anything about what competition there may be for those slots, however. I do suspect that the amateur transponders were tacked on to this proposal to enhance its appeal by offering the lure of a public service aspect.

ASR: Do you think that will sweeten the pot?

ARRL: I doubt that it will hurt.

ASR: It is not clear from the proposal who will be the lead organization in the relation between ARNET and ARRL. Is it your understanding that ARRL plans for the use of this bird could be vetoed by ARNET? Or vice versa?

ARRL: The way I read the proposal is that ARRL is the lead on operational matters. Frankly, though, many of the details remain to be worked out. We must point out, in general, that plans and talks are in a *very* preliminary stage. A great deal of ground remains to be covered and it would be premature to speculate on many of the finer points of detail. It's very, very early.

ASR: Speaking for ARRL, how do you feel about the concept and proposal in general?

ARRL: After nearly a decade of dreaming about a geosynchronous satellite, hopefully, the dream will be realized. The capabilities it embodies are potentially enormous. For example, the prospect of dispatching portable C-band terminals to disaster areas such as the hurricane-prone Caribbean in times of communications emergencies, is exciting. There's the prospect of high-speed digital data, video and more. In general, ARRL warmly embraces the approach with the sober realization that there are no guarantees that all the pieces of this very complex puzzle will all fall into place. We're hopeful they will, of course!

At press time AMSAT officials were analyzing the proposal in detail. The consensus among AMSAT officers was also one of guarded optimism. No one contacted by *ASR* felt that the prospect of ARNET would noticeably affect AMSAT's Phase III program. Phase IIIB will serve an international user base in contrast to the proposed ARNET which would serve only the Western Hemisphere while strongly favoring North America. The orbit of Phase IIIC has not yet been decided but a geosynchronous drifter with an orbital period of 30 days has been widely discussed. On the other hand, certain potential users of ARNET will relish the wideband resource and geosynchronous slot. Foremost in amateur scientific circles in this connection may be the Amateur Space Telescope Project at New York's Rensselaer Polytechnic Institute. They are designing a telescope for low earth orbit and require a telemetry relay satellite analagous to the U.S. Government's Tracking and Data Relay Satellite System, TRDSS. ARNET may be it. Other potential users are, no doubt, waiting in the wings too!

Seminar Precedes Annual Meeting

As previously announced in these pages, the AMSAT annual meeting wil be held Sunday, 10 October, at the Goddard Employees Recreation Center, Goddard Space Flight Center, Greenbelt, Maryland.

AMSAT has now announced that on the preceeding day, Saturday, 9 October, AMSAT will sponsor a series of forums with the general theme, "Phase III and You." The idea is to have a sort of "show and tell" session to "show" what hardware is now available for Phase IIIB ground station furnishings for both Modes B and L and to "tell" what techniques and preparations will be suitable for success on Phase IIIB. A specific agenda is to be issued soon and *ASR* will reproduce it when it is available. Meanwhile, you should plan to attend this important, milestone meeting and seminar.

(l-r) Doyle, WBØIUT, Chuck, KØNG and Tom, W3IWI revel in Tom's drawing winnings at the recent Cedar Rapids ARRL convention.

Ariane L5 Readied At Kourou

All indicators pointed to a launch of the European Space Agency's (ESA) Ariane early Friday, 10 Sept., 0230 UTC. L5, the first operational launch has been delayed months because of problems experienced with a prior payload, MARECS-A. MARECS-B is the payload on L5. Engineers and program officials are apparently satisfied that the so-called plasma sheath problems which arose on MARECS-A have been precluded on the "B" version by careful redesign of key features in the spacecraft.

At press time the L5 launch was scheduled for 0230 UTC, 10 Sept. 82. AMSAT has tentatively planned launch summary nets after the launch to report on the status of L5. Still in the planning stage, the nets likely would be held at 15-minute intervals on 3850, 14282 and 21280 kHz and report status only. No real-time retransmission of the launch countdown sequence audio is contemplated, however. Listen to the regular AMSAT nets for exact times of the summary launch nets tentatively scheduled (at this writing) for 0300 UTC (21280 kHz), 0315 UTC (14282 kHz) and 0330 UTC (3850 kHz) all on Friday (UTC) 10 Sept. 82. (Thursday evening 9 Sept. in the U.S.

Nominees List Told

According to Martha Saragovitz, AMSAT Office Manager, eight nominees will appear on the ballot for the election of AMSAT Directors. There are three Director seats up for election in this cycle.
The nominees are:

John Champa, K8OCL, of Ohio
Tom Clark, W3IWI, of Maryland
Jack Colson, W3OZ, of Maryland
Pat Gowen, G3IOR, of Norfolk
Gordon Hardman, ZS1FE, of Capetown
Doug Loughmiller, KO5I, of Texas
John Pronko, W6XN, of California
Jack Somers, WA6VGS, of California
Harry Yoneda, JA1ANG, of Tokyo

Ms. Saragovitz indicated that the ballots would be mailed the week of 23 Aug. Members who do not receive official ballots by mid-September should AMSAT HQ.

Did You Miss Us?

Just in case you hadn't noticed, it's been three weeks since the last *ASR*. The extra week was added in the publication cycle to allow a small vacation for our editors and also to provide a small window for the final push to get *Orbit* #11 out the door and into the mail. (#11, a 36 page effort, appears to be the cream of the *Orbit* crop so far).

ASR will be back on track in the coming weeks when we'll do a one week cycle to yield the overall average of 26 issues per year.

(l-r) W4DAQ, WØCY, W3IWI and (unidentified) discuss satellite matters beside the AMSAT Booth at Cedar Rapids.

	AO-8	UO-9
Element Set #	682	254
Ref. Epoch	82 223.54925171	82 228.37723719
1st Der. Mean Mot.	−.00000091	0.00009683
Inclination	98.7765	97.4969
RAAN	245.8768	190.3809
Eccentricity	0.0007758	0.0001273
Arg. of Perigee	100.2935	339.2802
Mean Anomaly	259.9098	20.8374
Mean Motion	13.96473038	15.16745555
Rev. # of Ref. Epoch	22602	4750

Anglo-Yank J-DX Claim

Citing a mutual visibility window of less than 30 seconds, two stations have laid claim to a new AO-8, Mode J DX record. On one end of the circuit was veteran DXer and European AMSAT Coordinator Pat Gowen, G3IOR. At the other end was the now well-known Lexington, Kentucky station of Bill Maxson, N4AR. Other claims to the all-time record including QSO's involving G6ADC, G4CUO, W4AUZ and WH6AMX appear to have been upstaged a bit by the 31 July N4AR-G3IOR QSO which occurred by sked at 11:11 UTC. G3IOR resides in Norwich, Norfolk on the eastern coast of England. Depending on what means are employed for determinations, there may be between −1.0 to +1.0 minutes of mutual visibility between Lexington and Norwich. In any case these two "pros" have now apparently closely approached the real limit of non-enhanced Mode J DX!

AMSAT HQ Closes

Office Manager Martha Saragovitz announces that the HQ office in Silver Spring, MD, will be closed for business the week of 30 August for vacation. Emergency messages may be left on the answering machine (301) 589-6062 or at the Lab (301) 344-7780.

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